

### **AMENDMENTS TO THE CLAIMS**

This listing of claims will replace all prior versions, and listings, of claims in the application:

### **LISTING OF THE CLAIMS**

1. **(PREVIOUSLY PRESENTED)** A sensor for detecting hydrogen peroxide, comprising an element exhibiting piezoelectric properties having a metal-oxide-containing coating, said metal-oxide having a divalent or tetravalent state and exhibiting a catalytic reaction with hydrogen peroxide.
2. **(ORIGINAL)** A sensor as defined in claim 1, wherein said metal-oxide is selected from the group consisting of lead dioxide (PbO<sub>2</sub>), silver oxide (AgO) and manganese dioxide (MnO<sub>2</sub>).
3. **(CURRENTLY AMENDED)** A sensor ~~as defined in claim 2,~~ for detecting hydrogen peroxide, comprising an element exhibiting piezoelectric properties having a metal-oxide-containing coating, said metal-oxide having a divalent or tetravalent state and a catalytic reaction with hydrogen peroxide, wherein said metal oxide is lead dioxide (PbO<sub>2</sub>).
4. **(ORIGINAL)** A sensor as defined in claim 3, wherein said element is a crystal that lacks a center of symmetry.
5. **(ORIGINAL)** A sensor as defined in claim 4, wherein said crystal is a quartz crystal.
6. **(ORIGINAL)** A sensor as defined in claim 5 having a resonant frequency of 5 MHz or 10 MHz.

7. **(PREVIOUSLY PRESENTED)** A sensor for detecting hydrogen peroxide, comprising a piezoelectric crystal that supports a lead dioxide ( $\text{PbO}_2$ ) coating that exhibits a catalytic reaction with hydrogen peroxide.

8. **(ORIGINAL)** A sensor as defined in claim 7, wherein said crystal is a quartz crystal.

9. **(ORIGINAL)** A sensor as defined in claim 8, having a resonant frequency of 5 MHz or 10 MHz.

10. **(CANCELED)**

11. **(PREVIOUSLY PRESENTED)** A sensor for detecting hydrogen peroxide, comprising:

- a substrate exhibiting piezoelectric properties having first and second major surfaces;

- a first electrode connected to said first major surface and a second electrode connected to said second major surface; and

- a layer of a metal oxide in a divalent or tetravalent state supported by at least one of said first and second major surfaces, said metal-oxide layer having a catalytic reaction with hydrogen peroxide to produce a change in a frequency of said sensor.

12. **(ORIGINAL)** A sensor as defined in claim 11 for sensing vaporized hydrogen peroxide.

13. **(PREVIOUSLY PRESENTED)** A sensor as defined in claim 11, wherein said substrate is of one of a quartz crystal, Rochelle salt, barium titanate, tourmaline, polyvinylidene fluoride and crystals that lack a center of symmetry.

14. **(ORIGINAL)** A sensor as defined in claim 13, wherein said substrate is a quartz crystal.

15. **(CANCELED)**

16. **(CURRENTLY AMENDED)** A sensor ~~as defined in claim 15~~, for detecting hydrogen peroxide, comprising:

a substrate exhibiting piezoelectric properties having first and second major surfaces;

a first electrode connected to said first major surface and a second electrode connected to said second major surface; and

a layer of a metal oxide in a divalent or tetravalent state supported by at least one of said first and second major surfaces, said metal-oxide layer having a catalytic reaction with hydrogen peroxide to produce a change in a frequency of said sensor, wherein said metal oxide is lead dioxide (PbO<sub>2</sub>).

17. **(ORIGINAL)** A method of determining the presence of a sterilant in a region of a decontamination system having a chamber defining the region and a circulation system for supplying the sterilant to the region, comprising the steps of:

providing in said region an element having piezoelectric properties with a metal oxide coating having a divalent or tetravalent state;

determining a baseline frequency of oscillation for said element in the absence of the sterilant;

determining a sensed frequency of oscillation for said element when exposed to the sterilant in said region; and

determining the concentration of the sterilant in said region based upon the difference between said sensed frequency and said baseline frequency.

18. **(ORIGINAL)** A method as defined in claim 17, wherein said sterilant includes hydrogen peroxide.

19. **(ORIGINAL)** A method as defined in claim 18, wherein said hydrogen peroxide is vaporized.

20. **(ORIGINAL)** A method as defined in claim 19, wherein said sterilant includes water vapor.

21. **(CURRENTLY AMENDED)** A method ~~as defined in claim 18~~, of determining the presence of a sterilant in a region of a decontamination system having a chamber defining the region and a circulation system for supplying the sterilant to the region, comprising the steps of:

providing in said region an element having piezoelectric properties with a metal oxide coating having a divalent or tetravalent state;

determining a baseline frequency of oscillation for said element in the absence of the sterilant;

determining a sensed frequency of oscillation for said element when exposed to the sterilant in said region; and

determining the concentration of the sterilant in said region based upon the difference between said sensed frequency and said baseline frequency, wherein said sterilant includes hydrogen peroxide and wherein said metal oxide is lead oxide.

22. **(ORIGINAL)** A method as defined in claim 19, wherein said element is a quartz crystal.

23. **(PREVIOUSLY PRESENTED)** A system for the deactivation of bio-contamination, comprising:

a system for moving a sterilant through a space;

a piezoelectric device that supports a metal oxide in a divalent or tetravalent state that interacts with said sterilant, said piezoelectric device having a frequency that changes in response to the presence of said sterilant; and

a controller having data stored therein relating to said piezoelectric device, said data relating a frequency of said piezoelectric device to a concentration of said sterilant.

24. **(ORIGINAL)** A system as defined in claim 23, wherein said sterilant includes hydrogen peroxide.

25. **(ORIGINAL)** A system as defined in claim 24, wherein said hydrogen peroxide is vaporized.

26. **(ORIGINAL)** A system as defined in claim 25, wherein said sterilant includes water vapor.

27. **(ORIGINAL)** A system as defined in claim 23, wherein said piezoelectric device is a crystal that lacks a center of symmetry.

28. **(ORIGINAL)** A system as defined in claim 27, wherein said crystal is a quartz crystal.

29. **(ORIGINAL)** A system as defined in claim 28 having a resonant frequency of 5 MHz or 10 MHz.

30. **(CANCELED)**

31. **(CURRENTLY AMENDED)** A system ~~as defined in claim 23~~, for the deactivation of bio-contamination, comprising:

a system for moving a sterilant through a space;

a piezoelectric device that supports a metal oxide in a divalent or tetravalent state that interacts with said sterilant, said piezoelectric device having a frequency that changes in response to the presence of said sterilant; and

a controller having data stored therein relating to said piezoelectric device, said data relating a frequency of said piezoelectric device to a concentration of said sterilant, wherein said metal oxide is lead dioxide (PbO<sub>2</sub>).